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The Care of Young Trees.

PROFESSOR BEAL, in a letter printed on another page of this issue, suggests the reason why so few practical results and real benefits have followed the wholesale planting of trees which has been going on in this country, or in some parts of it, at least, during the last dozen years. The twelve trees planted only a year before with impressive ceremonies, which Professor Beal describes, are a fair sample of the newly-planted trees in this country. It is an easy thing to pull up a sapling tree and then thrust it back into the ground again with dry and mutilated roots, for this is what tree-planting means to a not inconsiderable part of the community who plant trees. This operation comes within the scope of the most limited intelligence, and it can be completed in five minutes. It is a much more difficult matter, and one that requires patience, the power of observation, and skill to select and plant a tree thoroughly well, and then to see that it is properly protected from all the enemies which beset plant-life and so has a fair chance to grow until it attains a size and strength sufficient to enable it to take care of itself.

We have already explained more than once how trees should be planted; and now that the planting season is over for this spring a few suggestions upon the care of newly-planted trees may not be out of place.

Newly-planted trees, except conifers, and unless they are very small, or planted very thickly together, need the support of stakes to prevent the swaying of their heads from loosening the roots before they have taken firm hold of the ground. It is best to fix the stake firmly in the ground before the tree is planted, but if that has not been done a stout stake should be driven down close to the stem. It should be as high as the tree, which should be attached to it with bast, or with strips of linen, or of thin canvas from a point two or three feet from the ground to the very top. Cord or wire or any tying material which is hard enough to cut or injure the bark should not be used in fastening the tree to the stake. The reason why a stake as tall as the tree is needed is, that when a short stake is used, the stem of the tree being immovable and the top free to sway in the wind, the bark is bruised by rubbing against the top of the stake. Many young trees are injured in this way, and in some cases the stem is snapped off short in a gale just on a line with the top of the stake when the lower part of the tree only is held too rigidly.

Thorough cultivation is needed for newly-planted trees. It prevents them from becoming choked by weeds, and by checking evaporation increases the moisture available for their support. The surface of the ground, therefore, about newly-planted trees should be stirred once in every two or three weeks from the time they are planted until the middle of August or the first of September, when cultivation should cease, that a late growth may not be encouraged and that the wood may become thoroughly ripened before the advent of severe frosts. The weeds which start after the middle of August have only a brief life and cannot injure the tree. When a few trees only are planted, or when it is impracticable to stir the ground continually, the growth of weeds can be prevented and evaporation from the surface reduced by covering the ground with a mulch of strawy manure, meadow hay, spent tanbark, or the clippings from the lawn. A thick mulch if it is left on the ground all winter harbors field mice, and there is no mulch really so effective as the scuffling hoe, regularly and thoroughly used. Young trees require constant watching if they are to grow into fine specimens. Borers must be looked for and removed, and all the harmful insects which prey upon trees destroyed. The judicious employment of the nails of the thumb and forefinger on a young growing shoot will save the use of the pruning knife and the saw in later years. A little summer pruning of this character during the second and even during the first year after planting is of immense value to trees. A tree may thus be induced to assume the proper shape without any loss of vital force, and without any outlay beyond that of a little intelligence. A branch growing in the wrong position, or with an excess of vigor, an incipient fork which later may destroy the beauty and even the life of the tree, a false leader or unimportant branch crossing and chafing against an important one, may be rubbed out when the tree is young with the movement of the hand without inflicting a serious wound upon the tree. This familiar example will serve to illustrate, perhaps, the value of a little judicious pruning. It is not uncommon where second-growth White Pine abounds to find tall trees with a trunk divided close to the ground into two stems of nearly equal size. Such trees have little ornamental or commercial value. They have grown with two trunks because when they were little seedlings the leader was broken off, or eaten off by some browsing animal, and was replaced by two leaders of equal vigor. Had some one interested in trees and familiar with their mode of growth passed by the injured seedling a year or two after the accident, and stopped the growth of one of the leaders by picking out the top, or by knocking it off with his cane, the tree would have grown up as straight and tall as if no accident had ever happened to it, and a good tree would stand in the place of a misshapen one.

If a young tree is expected to grow into a noble, symmetrical, long-lived specimen it should be examined two or three times a year, and such pruning performed as may appear necessary; and this must be done during several years, until it has assumed its permanent form and attained a size which renders further care beyond the removal of dead branches unnecessary.

Many noble trees have grown, of course, to very great age without care and without thought, but the proportion of really good trees to the whole number which spring up naturally or are planted in the world is very small, perhaps not one in a million, and if even a reasonable proportion of planted trees are to fulfil a fraction of the hopes which fill the hearts of those who plant them they must be nursed and watched and cared for intelligently. It would be interesting to know how many of the 600,000,000 trees (if that is the number), which western Arbor-day

orators boast of as planted in Nebraska during recent years, ever survived the first summer, or how many among them promise to become of any permanent value to the community; or to know what proportion of the people of the United States who plant trees do it intelligently, and so reap the benefits which should come from their expenditure of money and time and labor.

It has grown to be a custom in several parts of the country to reward children in the public schools for planting trees, the amount of the reward being in proportion to the number of trees planted. A much wiser plan would be to give the reward five years after the trees are planted to the child who had reared the best tree. Quality is better than quantity in tree-planting, and the experience which a child would gain in caring for a single tree intelligently during five years would be worth more to him individually in after years and to the country at large than the careless planting of a much larger number, which, like the twelve Michigan trees, were only planted to perish—a result which is not calculated to have a stimulating or useful influence upon a youthful mind.

Kew Gardens.

SO many of our readers visit London every summer that we are sure to do them a service by reproducing for their benefit the following extract from an article which recently appeared in the *Saturday Review*, upon the greatest botanical and horticultural establishment in the world, where lovers of plants have more to learn than in any other spot:

"From time to time one of those people who apparently enjoy creating a little sensation by airing their imperfect knowledge of facts uplifts his voice in the House of Commons as aggrieved at the great expense to which the nation is put in maintaining the Royal Botanical Gardens at Kew. He is possibly under the impression—as, indeed, are the majority of people—that Kew Gardens are mere highly ornamental open spaces, to which the public and the inhabitants of Kew, especially, are granted admission at all times. Under these circumstances the keeping up of so many costly conservatories is, in the opinion of those who are not aware of the truth, inexcusable; and, although they have a vague idea that the Victoria Regia costs a small income to enable it to bloom annually, to the delight of holiday-makers and of our cousins from across the Atlantic, they would willingly vote for such a decrease in the grant accorded by the nation to the Directors of these Gardens for their proper preservation that before many months the most beautiful of Water-lilies would have ceased to exist and the great Palm-house be a howling wilderness. There is, however, every just reason why, instead of being diminished, the grant to Kew should be augmented. Let any intelligent person take the trouble to go systematically around these Botanical Gardens, and he will be at once convinced of their great importance, not only to England, but to the colonies and the Indian Empire; for they are emphatically not mere pleasure-grounds, but have a distinctive function to perform in the commercial economy of the country, and are the headquarters of a vast organization, having ramifications in every part of the known globe—and, we might almost say, the unknown, for missionaries and travelers are constantly sending to Kew from newly-discovered lands specimens of the rarest of plants, many of which are absolutely unknown to botanists. The staff of learned men engaged here is not a large one, but its activity and intelligence cannot be over-estimated. Thanks to them, no less than three important publications are issued every month from Kew—the *Botanical Magazine*, edited by Sir Joseph Hooker; *Icones Plantarum*, which deals with the dried or colorless specimens of plants; and the *Bulletin of Miscellaneous Information;* and to these may be added a number of special pamphlets, issued from time to time, treating of fresh discoveries, which are sent out to the colonial Governors, directors of museums and botanical gardens, as well as to the leading scientific men of Europe.

"To the right of the grounds stands an ancient mansion of the Georgian epoch, which in by-gone times was inhabited by the King of Hanover. It is now the principal centre of the organization to which we have above alluded, and here is preserved unquestionably the largest collection of dried specimens of flowers and plants in existence. Hither come students of every nationality to gather information which cannot be obtained elsewhere; and only the other day, when we were visiting the principal hall, a pile of pressed leaves and plants lay upon the table which had just arrived from a Jesuit missionary laboring in an unknown region of China. In the Gardens themselves are other special museums of great interest. The splendid Orangery has been converted into a museum for woods, tissues, roots, grains, seeds and models of edible fruits, many specimens of which figured in the great Exhibitions of 1851 and 1862, and in the Colonial and Indian Exhibition. And here we should not forget to mention the handsome gallery presented to the nation by Miss North, which contains the wonderful series of drawings of plants which she made during many years when on her extended travels through tropical regions. But, independently of the museums, the out-door gardens and the numerous conservatories are arranged on purely scientific principles, and, although they are very picturesque and beautiful, their utilitarian side is never for a moment lost to sight, so that the horticulturist can see for himself in the most practical manner how particular plants should be grown, as well as the results of their careful culture. None of the produce of the Gardens is sold, but the surplus of seeds and young plants is exchanged for other specimens from public institutions of a like character abroad. The great Palm-house is unquestionably one of the most beautiful and extensive in the world, and gives us as fair an idea of tropical beauty as it is possible to conceive without actually visiting a jungle; but close to it is a small conservatory of far greater value, in which plants of a useful kind are exhibited. Here, for instance, grows the Coca, whence the much-talked-of cocaine is derived. There are also several varieties of Teas, and a little plant, newly discovered—the *Gymnema sylvestre*, to which the attention of Kew was drawn by Sir Mount Stuart Grant Duff—from the leaves of which an alkaloid can be abstracted which deprives us of the taste of sweetness for at least forty-eight hours, without injurious effect; and hard by it is another newcomer, the Miraculous berry of the Gold Coast, the leaves of which, treated in the same manner, produce a totally different result, for they cloy the mouth with a saccharine sweetness so great that it matters not what we eat or drink afterwards it will always have, during the time the effect lasts, the flavor of honey. In short, Kew Gardens is a centre round which not only all the similar establishments in England but those of the whole Continent revolve; for it is acknowledged that it is the most complete of its kind in existence.

"The learned little world which does its work so regularly at Kew, in its various museums and offices, is of far greater importance to the world at large than is generally imagined. The chief secrets of botany are only now being disclosed; and, as within only a few years past such a wonderful anæsthetic as cocaine has been introduced, whereby certain operations can be performed with impunity, it would be hard to tell what fresh discoveries are in store for us, and it is only at such an institution as Kew that the scientist can diligently pursue researches which may eventually prove of inestimable benefit to mankind. Therefore, independently of their beauty as a pleasure resort, from a purely utilitarian point of view, Kew Gardens have claims upon the general public which it would be folly to ignore, and absolute wickedness to seek in any way to diminish. In connection with Kew it may be observed that, notwithstanding the enormous crowds which flock here on a fine Bank Holiday, scarcely a single instance of drunkenness or misbehavior has been registered; and it is pleasant to record that the tea-house and refreshment-kiosk, introduced after some demur, have proved very successful."

Boring Beetles in the Ash Finish of a Chapel.

A FEW years ago a self-constituted board of visitors invaded the chapel of the Theological Seminary at Andover, Massachusetts, and, like another board, not unknown to modern ecclesiastical history, proved the reverse of welcome to the faculty and trustees of that institution.

Under date of November 9, 1882, the treasurer of the seminary wrote us as follows: "You may have noticed in the public prints reference to a chapel in Andover, the finish of which is being eaten by worms. It is becoming a serious matter, for if it continues to spread, the finish of our new chapel will be ruined." A piece of the mop-board was sent us as a sample of the work, and a few days later Mr. Edward Taylor, the treasurer, wrote us that the evidence of the work of the borer had been found in various localities about the house, and that it was increasing, and he asked for information as to the best means of preventing further ravages from the worms, at the same time enclosing the following statements published by General Meigs, of Washington, and some suggestions which

are worthy of reproduction here. "The timber is suffering from a disease well known to the manufacturers of shovels and pickaxes, and called by them 'powder post.' A worm eats the ashen handle, which show minute holes, and when jarred by striking a hard substance gives out a shower of fine powder, 'powder post.' It is so common that they do not attempt to keep long any stock of handled spades, shovels and picks; and I was advised by the late Mr. Oakes Ames, at the close of the war, to sell off at auction the large stock of such stores left in the army depots, as it would be impossible to keep the handles from destruction.

"Saturation with petroleum was tried, and I think gave protection and prevented the progress of the disease.

"Perhaps petroleum applied in abundance by a sponge or brush might arrest the destruction to the Andover church.

"Captain F. Petrie, Honorable Secretary of the Philosophic Society of Great Britain, has written me as follows: 'I believe it will be found an effectual cure if the wood-work, or even the parts affected, are painted with parafine oil; I have not known it to fail. We are going to try it on places where we see them at work.'"

We suggested the application of a coat of oil to the "finish," as any oily substance if thoroughly applied would tend to soak into the wood, especially where mined by the borers, and kill them. It may be borne in mind that insects breathe by little openings in the sides of the body, and if a film of oil or any greasy substance spreads over the breathing pores or spiracles, the worms will speedily die by asphyxiation.

The oil was applied, with the results kindly communicated to us by Mr. Taylor, under date of March 28, 1888. "I have heard no complaint of these worms at work in our chapel for some time, in fact I think *evidence* of their work ceased to appear very soon after the application of the wash applied to the places where they gave signs of working. I think kerosene, or something of that kind, was applied, only in places where they threw out their champing, and this, I was told, was in what the carpenter called sap wood."

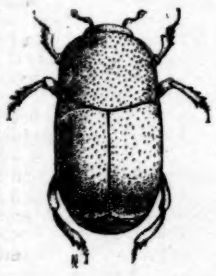


Fig. 108.—Teretrius Americanus, Lec.

The piece of Ash sent us in 1882 was honey-combed by the mines or tunnels of what was probably the young of this beetle, and which were between one and two millimeters in diameter; in some places there were a dozen holes, or places of exit made by the beetle, to a square inch of the surface. Much of the wood had been affected by dry rot, the work, as we understand it, of a fungus. It is most probable that the lumber used was affected by the dry rot, and that the larvæ of the beetles began their work in situations thus affected.

We have observed somewhat similar beetles (probably *Sinoxylon*) boring in the wooden bottom of a trunk, which had also been affected by "dry rot."

Specimens of the depredator, found in August, 1883, and which proved to be rather a rare beetle, were sent to our leading coleopterist, Dr. G. H. Horn, for identification, who was kind enough to name it as *Teretrius Americanus*, Leconte.

It belongs to the family of mimic beetles, or *Histeridæ*, so named from their power of drawing up their limbs and feigning death. Now, this insect does not belong to a group of borers, for most of the species, as Westwood says, feed upon decaying vegetable and animal matter, or on dung, while others are much flattened, and thus are adapted for a life under the bark of trees. However, some forms appear to connect the family Histeridæ with that of the stag beetles (*Lucanidæ*), whose larvæ are wood borers, though attacking rotten wood.

In this connection I may quote from a letter of Dr. Horn, in which he says: "The idea that they do the boring is strenuously opposed by Mr. George Lewis, who says that they enter the holes made by the larvæ of Lyctus and Sinoxylon with murderous intent. I cannot see any reason why they should be wood borers. In fact, I cannot recall any coleopter that is an in-borer. I am, therefore, inclined to accept his idea that they enter the holes with predaceous intent."

While there are no facts to justify the inference that the beetles themselves gnawed into the wood, it is not improbable that their young or larvæ were the culprits. Yet, no larvæ were found in the piece of wood sent us, and only one or two of the beetles, and it is rather singular that more dead specimens did not remain in the wood. At present, then, we are inclined to believe that the Teretrius in the larvæ state made the tunnels, though it is still not impossible that some species of *Sinoxylon*, a small beetle of the size and general appearance of the Teretrius, may have been the culprit. Moreover, we are inclined to believe that the ash wood used in making the finish was affected by dry rot, either before or very soon after it was put into the chapel. *A. S. Packard.*

Providence, R. I.

The Lindens of Western Europe.

EUROPEAN Lindens were introduced early into the Eastern States, and, although now known to be not as well suited to the American climate as our native species, they are still favorites with many persons, and numbers of them are planted every year, especially in the neighborhood of the great nursery centres.

Planters of these Lindens in Europe, as well as in this country, rarely distinguish, however, between the three species of western Europe, which they generally regard as one and the same plant, usually called in nurseries *Tilia Europæa;* and the specific characters and the nomenclature of these trees are still, apparently, very imperfectly known, except by botanists familiar with the European flora.

Linnæus, to be sure, in the "Species Plantarum," grouped the different European Lindens together under the general name of *Tilia Europæa*, distinguishing five varieties Scopoli, in the "Flora Carinolica" (1772), separated the Linnæan species into two—*Tilia platyphyllos* (the Var. ε. of Linnæus) "*folia magna, subhirsuta;*" and *Tilia ulmifolia* (the Var. γ of Linnæus) "*folia duriora, minora, nullibi villosa.*" Hayne, in the "Abbildungder Deutschen Holzarten" (1815), further divided the Linnæan species by proposing a third—*Tilia vulgaris* (*T. intermedia*, DC. "Prodr.," 1., 513). Colored figures showing plainly the characters of the three forms were published by Hayne, with whose views as to the limitation of these species later botanists, from De Candolle to Nyman, have generally concurred.

I can find no distinguishing characters in the bark, in the habit of growth, or in the flowers, which in all three species are destitute of the petaloid scales that occur in those of our American species, or in the winter-buds of these trees as they are found growing here; but in the leaves and in the fruit they are clearly distinct, as will be seen from an examination of the figures upon pages 256 and 257, drawn by Mr. Faxon from specimens cultivated in the neighborhood of Boston, where at least one species is common.

The following characters, therefore, may be found useful in enabling cultivators who cannot always readily refer to the old figures to distinguish the different species.

CONSPECTUS OF THE SPECIES

Leaves pubescent: fruit prominently four-ribbed at maturity . . . . . 1. T. *platyphyllos.*

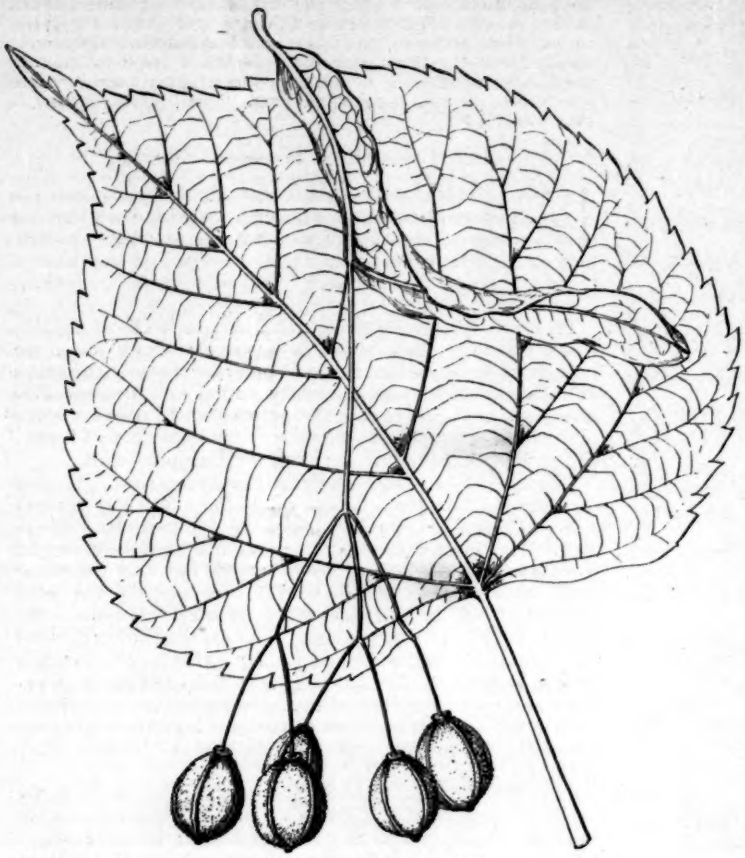
Leaves naked, except in the axils of the principal veins: fruit destitute of wings.

Leaves ample, the base more or less oblique, green on both surfaces: tufts of hairs pale: shell of the fruit thick and tough. . . . 2. T. *vulgaris.*

Leaves small, sub-cordate or rounded at the base, pale on the lower surface: tufts of hair, rusty brown: shell of the fruit thin and brittle. . 3. T. *ulmifolia.*

Tilia platyphyllos, Scop. Young shoots and petioles hairy-pubescent; leaves large, four and a half to five inches long by four inches broad, thick, distinctly yellow-green, cordate, or, sometimes, slightly oblique at the base, coarsely and sharply serrate, softly puberulent on the upper, densely pubescent on the lower surface; fruit top-shaped or oval, prominently four-ribbed at maturity, and coated with pale brown tomentum.

This tree may always be easily distinguished, even at a considerable distance, by the marked yellow tone of the green of its foliage. It is the first of the Lindens to bloom, the flowers appearing here sometimes as early as the middle of June; and the first to lose its leaves in the autumn. In dry seasons the leaves, even in Europe, begin to shrivel and turn brown in August, and sometimes fall in September—peculiarities which make this species the least desirable of the Lindens for ornamental planting.



Fig] 109.—Tilia platyphyllos, Scop.

It is widely distributed through central and southern Europe, and is a southern rather than a northern tree, although, according to Dr. Bolle, who has favored me with some interesting notes upon European Lindens, it occurs sparingly in Denmark, western Sweden (where he has found it forming small groves on several islands in the neighborhood of Strömstad), in Poland, and eastward as far as the Ural Mountains. It is the "Grossblätterige Linde" of the Germans. This tree appears to have been a favorite with Le Notre, who planted it largely at Versailles, and it is the tree which forms the clipped alleys in the garden of the Tuilleries in Paris. It is not very often seen in this country.

Tilia platyphyllos has produced more varieties than the other species, either from a greater tendency to sport, or because it has been cultivated longer and more generally. Ten or fifteen varieties, of no particular value, are met with in nurseries, the most distinct, perhaps, being *T. vitifolia*, *T. asplenifolia* and *T. corylifolia*.

2. *Tilia vulgaris*, Hayne. Young shoots and petioles glabrous; leaves ample, three and a half to four and a half inches long by three to four inches broad, thin, cordate or often oblique at the base, sharply serrate, green on both surfaces, and quite naked, with the exception of the tufts of pale hairs on the lower surface in the axils of the principal veins; fruit oval or sometimes nearly round, coated with dense, short tomentum, the shell thick and tough.

This is the "Zwischenlinde" of Karl Koch, and it is often called the Dutch Linden from the fact that it was early and largely propagated in Dutch nurseries. It appears to be the largest of the European Lindens, and the most generally cultivated, although the least frequently seen in a wild state. Nyman credits it to the countries of central and south-eastern Europe; but Dr. Bolle writes, "I can only remember to have seen this tree once myself growing wild—a single specimen in the rocky chasm of the Virga Valley, near Botzen, in the Tyrol, where it seemed to be growing spontaneously. If its native locality is doubtful, however, it is certain that it has been cultivated as a park and avenue tree for nearly three centuries. The rows of trees which have been planted in our cities since the seventeenth century are comprised, almost without exception, of this species." It is the *Tilia vulgaris* which gives its name to the most famous street in Berlin, and which is so often seen in English parks and gardens; and it is the species—so far as I have been able to observe—which has been planted the most frequently in the United States. The old, and sometimes very large, Lindens which are still found in the suburbs of Boston and New York belong to this species, which is the one commonly planted on Boston Common. It flowers here during the last week of June, or nearly ten days later than *Tilia platyphyllos*.

3. *Tilia ulmifolia*, Scop. Young shoots and petioles glabrous; leaves small, two to two and a half inches long by nearly as much broad, thin sub-rotund or cordate at the base, sharply and minutely serrate, green on the upper, pale, or often nearly white, on the lower surface, which is conspicuously marked with large tufts of rusty brown hairs in the axils of the principal veins; fruit oval, obovate, or sometimes nearly round, the tomentum with more scattered and longer hairs than in that of the last species, the shell very thin, papery and brittle.

I retain for this species Scopoli's name of *T. ulmifolia* because it is the oldest (1772). The leaves, however, do not resemble those

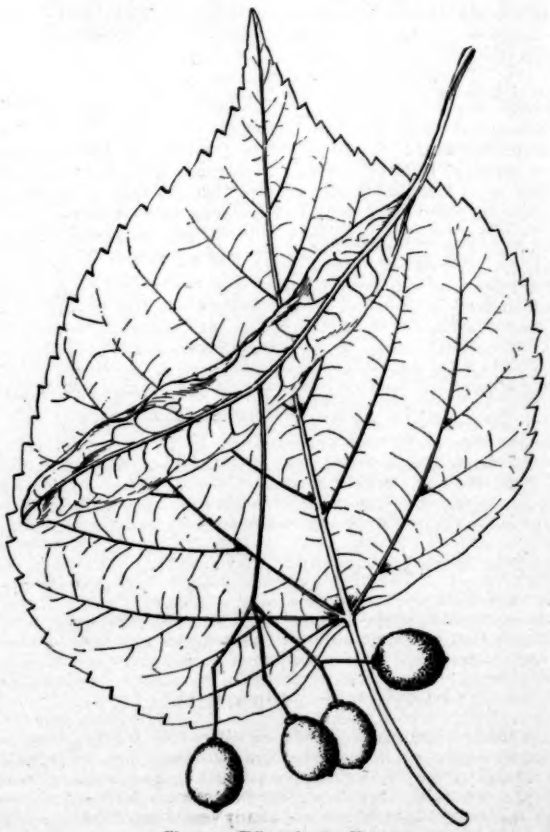


Fig. 110.—Tilia vulgaris, Hayne.

of an Elm-tree in any particular; and the name is a much less appropriate one than *T. cordata*, Mœnch (1785), or *T. parvifolia*, Erhardt (1794), which is the best and the one now most frequently used by botanists, although De Candolle adopted for it Ventenat's name of *T. microphylla*, which was not published until 1803.

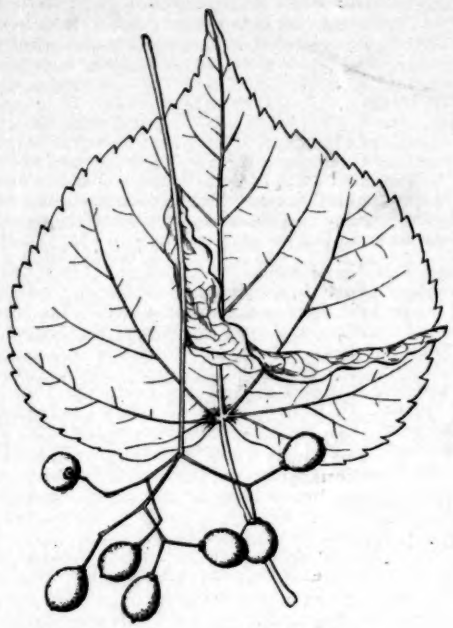


Fig. 111.—Tilia ulmifolia, Scop.

Tilia ulmifolia is the common Linden of northern Europe, although it is found, apparently, all over the Continent, especially at high elevations. In southern Italy, according to Bolle, it is more common than *T. platyphyllos*. "Both species," he says, "grow wild in the wooded regions of the Apennines, and both are very commonly cultivated in the Mediterranean countries. I must be pardoned for disagreeing with Karl Koch when he says 'this tree never grows so old or so large as *T. vulgaris* or *T. platyphyllos*,' now that I have seen the beautiful great Lindens at Paelitzaerder on the Paarstein Lake at Uckermark. There enormous trees, which all belong to *T. ulmifolia*, are scattered in isolated specimens over the whole island and shade the ruins of an ancient abbey built in the thirteenth century. The trunk of the largest of these old trees, which are still in an excellent state of preservation, girths nearly twenty-three feet; and there are many others scarcely inferior to it in size."

Tilia ulmifolia, although perhaps the most commonly and widely distributed of the European Lindens, has been, so far as my own observation goes, much less frequently planted in central Europe than either of the other species, and I do not remember having seen anywhere a very large or remarkable specimen. It is seen in this country more rarely even than *T. platyphyllos* and we have succeeded in finding only two or three small trees in the neighborhood of Boston. It does not flower until towards the middle of July or nearly a month later than *Tilia platyphyllos*. It would be interesting to know if there are anywhere in the United States large specimens of the small-leaved Linden.

C. S. S.

Cultural Department.

Some Iron-clad Pears, Plums and Cherries.

ALTHOUGH the very large number of varieties of Apples, Pears, Plums and Cherries imported by Professor Budd and Mr. Charles Gibb from north-eastern Europe will require the experience of a great many years before we can determine their exact value and relative importance for all sections of our cold North, one thing, at least, has already been settled in the last five years in regard to them. They are, in their earlier years, to a very marked degree more hardy against winter's cold than any we have before had in cultivation, except the few estrays which had already reached our shores from the same regions. It is only necessary to plant an Apple-tree like the Duchess of Oldenburgh, in a locality where the winter's temperature frequently touches the freezing-point of mercury, to become satisfied that here is a class of Apples entirely unlike those we possessed previously. The cheerful indifference with which such temperatures are endured by these trees is entirely unlike the woe-begone results seen upon many of the varieties which are classed among our hardy Apples.

This is the result, at least, of five years' experience with the Pears, Plums and Cherries brought to us by Messrs. Budd and Gibb from Baltic Germany, Poland and Russia. They are nearly all as indifferent to extremes of minus temperature as our native Plums and Cherries, while we find in them the ameliorations consequent upon centuries of cultivation and selection. Among upwards of 100 varieties of Apples, thirty-one of Cherries, seven of Plums and sixteen of Pears, selected from the most promising sorts for trial on my own grounds, it is yet premature to pass judgment upon any except as to the hardiness and vigor of growth exhibited by them for the four or five years that I have had them, which include two winters never exceeded, if ever equalled, for severity since thermometrical observations have been recorded in north-eastern Vermont and the Province of Quebec. A few of the Apples, Plums and Cherries have given me specimens sufficient to justify a strong belief that these fruits are likely to meet reasonable expectations as to their size, beauty and quality. The Plums are in color red, white and blue of varying sizes and seasons from early to late. The Cherries that have fruited belong to the Girotte or Morello class, variously crossed upon, and varied under culture, so that among them are several that approach closely to the Hearts and Bizarreaus in size and sweetness. Many are remarkable for the relative smallness of their pits, and the juice of some is deeply colored. Others, such as the heart-shaped Weichsel, show a cross between the sweet Mirello and the Dukes. This variety is used in east Europe as a lawn-tree on account of its symmetrical growth and its handsome striped leaves. The fruit is large, heart-shaped, purplish-black, and nearly sweet. Nearly all these Cherries are distinguished from our hardiest common sorts (Pie Cherry, etc.) in being hardy both in tree and in blossom-buds, so that they not only live and grow, but bear plentiful crops of fruit. There is a large family of these Cherries, classed together as Amarelles, embracing a considerable variety, along with family likeness. The trees are rather small, and heavy bearers while quite young. The Astherm family is also an interesting one, numbers of which were brought into Iowa and Minnesota by German immigrants some twelve or fifteen years ago, and have proved reliable bearers in those states where all other sorts failed. The fruit of these varies, yet a family resemblance is seen in all of them. The Vladimir race, from the Russian province of Orel, is quite dwarf, with mild, sub-acid fruit, larger than Montmorency, and in some varieties nearly black, with a mild, sub-acid flavor.

Of the Pears I can only as yet report a most vigorous growth, so that some of my trees, five years planted (twelve to eighteen inches high at the start), are now fully nine feet high. They are evidently early bearers, as one showed a cluster of flowers last year, and two are this season crowded with fruit-buds. If the omnipresent small boy will allow them to mature I shall be glad to send specimens to GARDEN AND FOREST.

Newport, Vt. *T. H. Hoskins*

Orchid Notes.

Epidendrum prismatocarpum.—Of the three hundred and more species which constitute the genus Epidendrum, by far the greatest number of them possess inconspicuous and dingy colored flowers, which render them only valuable to botanical collections. There are a few, however, whose flowers have sufficient beauty to make them favorites with cultivators, and among these must be classed the subject of the present note.

Although *E. prismatocarpum* is a very old inhabitant of our Orchid-houses, it is, nevertheless, by no means plentiful, which explains why it is heard of so seldom. As far back as 1852 it was described by Professor Reichenbach in the *Botanische Zeitung*, but it did not make its appearance in cultivation until about ten years afterwards, when it was sent to Europe from Veragua and Chiriqui, where it was first discovered by Warscewicz.

This species may be readily recognized even when not in

flower, by means of its long, deep-green, flask-shaped, pseudo-bulbs, from the apex of which are given off two shining, green, strap-shaped leaves, gracefully recurved, and an erect peduncle, bearing from fifteen to twenty large flowers, the sepals and petals of which are pale yellowish-green, covered with large blackish blotches, which give them a very bizarre appearance. A striking contrast is presented to the sepals and petals by the long, triangular lip, which is generally of a warm rose color. There is great variation among the flowers of this species, caused, no doubt, by different treatment and conditions. In some the blotches are pale and the flowers few and small, while in others the flowers are large and plentiful and richly colored. They are produced during April and May and will last for several weeks, so that the plant might be used with advantage as for exhibition purposes.

It should be potted firmly in peat and sphagnum moss, and as it grows during the winter months—a fact worthy of notice—water should be given freely according to circumstances, as well as frequent syringings, which keep pests away. The plants, although at rest during the latter part of the summer and autumn, must nevertheless receive enough water to keep the pseudo-bulbs and leaves in a plump condition. A temperature of about 60°–70° Fahr. suits it admirably.

Maxillaria Sanderiana.—The genus Maxillaria, although a tolerably extensive one—comprising upwards of 100 named species—cannot be said to be much of a favorite with Orchid growers. There are a few, however, which are always considered to be of sufficient value to find a place in every collection, and among these it is universally acknowledged that *M. Sanderiana* is the finest representative of the genus yet known. It was introduced to cultivation about four years ago by Messrs. Sander & Co., St. Albans, England, whose collector found it growing on the Cordilleras of Ecuador and Peru at an elevation of about 4,000 feet. Unfortunately, most of the plants sent home at that time had perished during the voyage, notwithstanding the care taken of them, consequently, there are as yet very few plants to be met with under culture.

A good specimen is now in flower here. It has ovoid, compressed pseudo-bulbs, and dark-green, elliptic-oblong leaves. The flowers, which are as large as those of any ordinary *Lycaste Skinneri*, are borne singly on the end of short scapes, which spring from the base of the previous year's pseudo-bulbs, and are covered with large, dull brown bracts. The upper half of the large sepals is pure white, the lower half being washed and blotched with very dark crimson. The petals are similarly marked, but are much smaller in size. The side lobes of the lip are erect, while the middle one is slightly recurved and crisped around the margin. The color is dull buff-yellow on the inner surface, with a brighter yellow callus on the disc, while the outer, or under, surface is blotched and stained with blackish-crimson. The flowers of this species present very little variation, although a faint, rosy tinge may sometimes be observed at the tips of the sepals and petals.

Taking into consideration the elevation at which this Maxillaria grows in its native country, it must not be regarded as a hot-house Orchid; and it will thrive in a house with a temperature ranging from 60°–65° F. When once established, this species may be as easily grown as some of its better known congeners. It is rather difficult, however, to get imported plants to begin to grow, and, in order to bring this about, the plants should be placed among broken crocks in a house with a warm and moist atmosphere until they begin to make new growths. They may then be put into baskets, in a compost of fibrous peat and sphagnum moss, and placed in such a position as to obtain an abundance of light and air during the summer months, which is the season when they make their chief growths, and during which period they may receive plenty of water. The plants require very little water in the winter, which is the resting period, and hardly any water at all is necessary during the flowering season, which is usually in April and May.

St. Albans, May, 1889. *John Weathers.*

The Irises.—The new *Iris tenuis*, figured in an early issue of Garden and Forest, has proved hardy here during the past winter. The plants received last spring were planted under Pine-trees, the needles of which provided a good winter covering. Plants that were left out are coming up strong, and others lifted flowered nicely in pots. *I. tenuis*, as a decorative plant, has no greater value than many of the older sorts. *I. Douglasiana*, a pretty Californian species, is now in bloom, and is a very showy plant. We have had no experience as to the hardiness of this species, but it is well worthy of pot-room in winter. *Iris verna*, another native species, is now at its best, the perfume of its delicate blue flowers reminding one strongly of Violets. This Iris does well in all kinds of soils and makes a good border-plant. *I. tenax* and *I. Missouriensis*, two species somewhat alike, are also in bloom, to be followed later by *I. oxypetala*, which is, perhaps, the best of all native Iris. *I. pumila* and its many varieties are, and have been, making a fine display. These were the first to bloom in the open ground, followed closely, however, by *I. arenaria*, a charming European species, with narrow grass-like foliage, almost hidden by the bright orange-yellow flowers, which are fragrant. This plant succeeds best in a sandy soil or when planted in the rock-garden. *I. Cengialti* is another comparatively new plant, and one which no lover of this beautiful family should be without. In general appearance it resembles *I. Germanica*, the flowers being fully as large, dark blue, with an orange blotch on each petal. The plant, however, is quite distinct, flowering two weeks earlier, and being dwarf, not exceeding one foot in height. *I. Sibirica hæmatophylla* is now at its best. This plant has blood-red leaves, with blue flowers, and has the special value of producing a second crop of flowers later in the season.

Aquilegia Canadensis aurea.—We do not know if yellow forms of *Aquilegia Canadensis* are common, but we received, some three or four years ago, one plant which has proved to be sufficiently distinct and fixed to warrant the varietal name aurea. The flowers are pure yellow without a trace of red. We had thought it might probably be referred to one of the yellow species, but find that of the seedlings raised from isolated plants, about ten per cent. show a reversion to *A. Canadensis*. The plant under note does not exceed a foot in height, and is completely covered with its pretty flowers, resembling in color those of *A. chrysantha*.

Camassia Cusickii.—This species, figured in Garden and Forest, last year (i. 174, fig. 32), is again in flower, and gives promise of becoming a valuable addition to our hardy flower-garden. The whole plant is much stronger and larger than any other species with which we are acquainted. The flowers when first expanded are white, changing to pale blue after they have been open a few days. All the Camassias are perfectly hardy in the eastern States, but, like most bulbous plants, thrive best when planted in a porous soil. *E. O. Orpet.*

Passaic, N. J.

Setting Plants and Trees is not necessarily a laborious operation. I am surprised how little one need use a spade in the work. In fact I use the spade in garden work less and less each year. For setting all bush-fruits we plow a furrow with an ordinary winged potato-plow. Set the wings at their widest; they will then throw out a lot of loose earth which is easily used by the hands. Then return in the same furrow with the wings closed, plowing deep, so as to make mellow ground for the roots of plants. In nice garden soil, not too wet, we then discard tools and put in the plants with our hands. If the soil is too heavy or wet for this, one man uses a shovel while another places the plants. Yesterday we set a lot of Service Berries in a clay soil in this manner, one man shoveling in the furrow and another handling the plants, and did it so rapidly that I had difficulty in clipping the single shoot of the plants and dropping them as fast as they were wanted. The plow can be used to good advantage in setting orchards.

Digging big holes for trees should be unnecessary. Dr. Warder said that the hole for a tree should be as large as the orchard. This is the best of advice. It means that the ground should all be well prepared before a tree is put into it. Then one needs to dig only far enough to allow the roots to fall in easily. But the hole must be big enough for the roots. Do not twist or crowd them; and here is where the ordinary tree-planter will shirk. Before you know it he will stick in a tree with the ends of the roots all but peeping through the ground. "Don't be stingy with your holes," is advice which I have to give almost every day in planting-time. Get the fine earth firmly in and about the roots. This usually requires the work of the fingers, but it can be done without fussing.

Grafting.—All the kit of glue-pots and brushes and elaborate mastics are a nuisance in the top-grafting of an orchard. The only use I could ever find for hot wax was when grafting was so abundant that some of it had to be done in March and early April. Hard wax that will warm up in the hands and has grain enough to stretch is much superior to any other. Of course the hands must be greased, but the work is by no means disagreeable. The wax one buys of dealers is nearly worthless, so far as my experience has gone. It has not been worked by hand, "pulled," and has no fibre. It breaks.

Cornell University. *L. H. Bailey.*

Chrysanthemums for the Border.—There are some varieties which are handsome as well as early, and they can be trusted to make a good display before frost. It must not be expected, however, that the individual flowers will be as large as those of later flowering kinds. It must be remembered, too, that, in order to have good Chrysanthemums anywhere or at any time, the plants must be well fed and they must not be crowded—two feet square is the least space in which they will thrive. Here are a dozen good, early varieties: The two forms of Madame Desgranges, yellow and white; Madame Domage, blush; Chevalier Domage, yellow; Précocité Japonaise, red; Blanc Précoce, white; L'Ami Couderchet, lilac; Fiberta, yellow; Salter's Early, blush; Roi des Précoces, red; Mandarin, pink; La Vierge, white.

Pearl River, N. Y. *John Thorpe.*

Notes from a Northern Spring-Garden.

Corydalis nobilis is a handsome Siberian species, and a real acquisition to the list of hardy rock-garden plants. It grows some eight or nine inches high, with bi-pinnate, delicate leaves, with rather broad cuneate divisions and large, broad racemes of pale yellow flowers, tipped with green. It has been grown in gardens for more than a century, but is rarely met with in those of this country. It thrives in all soils and positions, and demands no special care or attention.

Clintonia borealis is at its best, and an attractive plant, with its yellow, nodding, Lily-like flowers, borne on slender scapes above the broad, strap-shaped leaves, which lie close to the ground; and still more attractive, perhaps, in August, when the flowers are succeeded by large, bright blue berries. It grows naturally under trees in rather dense shade, and in such positions, when it is transferred to the garden, it will be found to flourish, although we have not succeeded yet in inducing it to spread very far; and seedlings have not appeared yet. The Podophyllum or Mandrake (*Podophyllum peltatum*) is an easier plant to establish, and one of the most effective in foliage, with its broad, round, five to seven parted leaves, eight or ten inches across, raised a few inches above the ground on stout stems inserted in the centre. They look like miniature umbrellas, and quite hide the handsome, solitary, nodding, white flowers, which grow on separate bi-foliate stems, and the large fruit, which ripens in early summer—the May Apple, well-known to country boys. This plant is found in the low, rich woodlands of the middle and western States, where it is everywhere common. It spreads rapidly from underground creeping root-stalks, and will soon extend far beyond the place allotted to it in the garden.

Iris cristata, the crested Iris of the Allegheny Mountains, with its lovely pale blue, long-tubed flowers, is in full flower, and certainly one of the most beautiful of all the dwarf species. It spreads almost too rapidly, however, in the border or in the rock-garden, and it has now been transferred to a half-sunny slope on the edge of a wood, where it has already spread quite widely through a thick sod of Grasses and Sedges, which are unable to greatly retard its growth or to prevent it from flowering freely. It is one of the best plants which has been tried here for naturalizing in such situations, which can often be greatly improved by a cautious introduction of many plants chosen with reference to harmony with their immediate surroundings.

The rare and remarkable *Carex Fraseriana* is well established, and has been in bloom for several weeks in the dense shade of an over-spreading bush. It would hardly be taken for a Carex, with its broad leaves and globular heads of flowers, on slender scape-like culms. It is a plant not without beauty when in flower, but its interest is rather botanical than horticultural. It is one of the rarest of the genus in America, and is confined to the mountains of Virginia and Carolina.

There is a little prairie flower, very familiar to the inhabitants of the West, and a pleasant remembrance always to people who have traveled over the grass-covered plateaus beyond the Mississippi, known as the Shooting-star from the peculiar form of the flowers. It is the *Dodecatheon Meadia* of the botanists, a member of the Primrose family, and a beautiful plant in cultivation, with Cyclamen-like flowers, borne in ample umbels at the summit of a stout scape, about a foot high, springing from a cluster of oblong leaves. The corolla is rose-colored or sometimes white, with a very short tube, a thickened throat and a large, five-parted, reflexed limb, giving to the flower a fanciful resemblance to a comet or shooting-star. The Dodecatheon has been a popular plant in cultivation for many years, and many varieties have been raised by gardeners with enlarged flowers of different shades of color, but it is doubtful if any of them are superior in beauty to the wild form of the prairie. It flourishes in full sunlight, is easily raised from seed, like most of the other plants of its alliance, is easily transplanted and fairly durable. Just now several masses are in full bloom, and are beautiful and attractive.

Aubretias are, so to speak, conventional rock-garden plants; that is, they are always included in lists of these plants, and if a beginner in this sort of gardening orders rock-garden plants from a dealer he is pretty sure to find some Aubretias in his order. They are natives of southern Europe, and several species and a number of varieties of the best known of these, *A. deltoidea*, are in cultivation. This is a charming plant, admirably suited for the margins of rocks, where it can spread and send its slender, trailing stems through the crevices, making a wide, moss-like mass of pale green, persistent foliage, which is now covered with a sheet of pale purple flowers, large in proportion to the height of the plant, being half an inch across. Not quite hardy here, it requires careful protection in the winter and an open, sunny position. The Aubretias may be readily increased by cuttings, or young plants can be raised from seed.

There are a number of dwarf shrubs now in flower well suited to embellish the rock-garden, where, owing to their dwarf size, they can be seen to better advantage than in the shrubbery, where, too, they are liable to be overcrowded and finally destroyed by more vigorous plants. The best known of these, thanks to Emerson's poem, is the Rhodora (*R. Canadensis* or *Rhododendron Rhodora*). It is a low, deciduous shrub, growing to a height of two or even three feet, with rosy-colored flowers, which appear before the leaves. It is easily cultivated, and can be readily transplanted from its native swamps into the garden, where it will grow and spread quite quickly if deep, peaty soil and an open position are provided for it. The flowers are very short-lived, and two or three days of hot sun quite finishes them. It is one of the plants which looks well only when seen in large masses, as it may be in some parts of northern New England, where sometimes covering acres of bog, its flowers look like a soft, rosy flush of light thrown over the ground. A far more beautiful plant in flower, and one of the most beautiful of all our native shrubs, is the little bog Kalmia (*K. glauca*), a delicate plant not more than a foot high, with wiry branches and straggling habit, narrow, revolute leaves, quite white on the lower surface, and few-flowered corymbs of very large, rosy-purple flowers, which make a great show just now. It is not a very easy plant to establish, and it is fastidious always and liable to die if exposed to too great summer heat, but the beauty of the flowers is so great that they are worth a real effort to obtain in good condition.

Daphne Genkwa is very fine this year, finer than I remember to have seen it, the mild winter having been, no doubt, favorable to the good development of the tubular, lilac-blue flowers, which in color have no counterpart among those of shrubs which are hardy in this climate. It is to be regretted that it is not more hardy here, for it is certainly one of the most attractive of the dwarf shrubs of Japan, where it is highly prized as a garden-plant and for its reputed medical properties.

The earliest of the Blueberries are in flower, and few shrubs are more beautiful than some of the dwarf species, like *Vaccinium Pennsylvanicum* and *V. Canadense*. They make a charming carpet under trees, where they are found growing naturally in half open situations. None of the Vacciniums are very easy plants to manage, but they can be grown by any one who will pay close attention to Mr. Dawson's directions for the management of these plants published upon page 183 of volume i. of this journal. They have many claims upon the lovers of beautiful plants—good habit and foliage, handsome flowers and fruit and brilliant autumn coloring.

Boston, May 11th. *C.*

Notes from the Arnold Arboretum.

THE Peach is not in this latitude a very reliable flowering tree, the buds being often destroyed in winters of even ordinary severity. This year, however, Peaches are exceptionally fine, and trees of some of the double-flowered varieties have been objects of wonderful beauty. There are a number of these varieties in cultivation, and new ones appear from time to time; but the three best worth growing have been known for many years—they are the double pink, the color of the flowers being almost identical with that of the common Peach of gardens, the double white and the double scarlet, on which the flowers are blood-red. A fourth variety, in which the color of the flowers is intermediate almost between those of the pink and of the scarlet varieties, although showy and conspicuous, is perhaps a less desirable plant than either of the others. The double scarlet Peach, in

flower, is one of the most striking, almost startling, objects imaginable, while the double white, owing to the profusion of the flowers, when the buds are not destroyed by frost, is for a few days one of the loveliest of all spring-flowering trees. These double-flowering Peaches are in bloom generally a week or ten days later than the common Peach. Like them, they are subject to the attacks of fungus and of borers, and are short-lived, and must, therefore, be often renewed. Their beauty as ornamental trees is confined to the short flowering time, so that, in spite of the loveliness of the flowers, they should not be planted here as freely as some other showy-flowered trees, especially as the climate does not suit them particularly well. The variety with blood-red flowers may be seen in some of the public squares of Washington, where there are many fine specimens, in very great perfection, and it is doubtful if any one seeing this tree there in flower for the first time passed it by without an exclamation of admiration or without asking what it was.

A large number of the so-called "flowering" Apples are now at their best. They flower usually ten days later, but the unprecedented heat of the last few days has forced many plants into bloom long before their time. These small Apples, taken as a whole, surpass all other trees here in floral beauty at this particular period of the year, and there are no more satisfactory plants for the May decoration of the lawn or the shrubbery. They flower profusely, at least most of the varieties do, year after year; they are indifferent to cold, to heat or to drought, and they do not grow unmanageably large. They like rich soil, and well repay generous treatment.

It is hopeless, and certainly not necessary, in these notes, to try to unravel the intricacies of the synonomy of the Apples, or even to refer in every case the cultivated forms to recognized species. The species of Apples, their origin and distribution have puzzled the best-equipped botanists, and no two of them have ever held quite the same views with regard to these plants.

There is a very large number of these Apples in the Arboretum, gathered during many years from the best European collections and raised from seed obtained from all available sources. Speaking broadly, they may be referred to four types. There are, first, the varieties of the common Apple (*Pyrus Malus*) which are generally recognizable by the light gray bark, pale leaves, which are, with the petioles and shoots, woolly-pubescent on the lower surface while young, and by the minute, scale-like bract on the peduncle. There is a handsome variety with double flowers; others with pendulous branches or with dwarf habit, and one curious one with shrubby habit, narrow leaves, and small fruit less than an inch in diameter, and persistent upon the branches until after the flowering-time the following year.

Next should be mentioned the Chinese Apple (*Pyrus spectabilis*), a well marked species not difficult to distinguish, at least in the double or semi-double flowered form—the only one apparently now known in cultivation. The flowers were figured in this journal last year (i. 272, f. 214), and there are colored plates in the "Nouveau Duhamel" (vi. t. 42, f. 2) and in Watson's "Dendrologia Britannica" (i. t. 50). It is one of the handsomest of the whole race, and one of the most profuse and persistent bloomers. It is a shrub-like tree, reaching a height of twenty feet, characterized by the upright habit of growth of the branches, which give to fully grown specimens a sort of vase-like form, reddish-brown bark, oblong-ovate leaves, which, like the peduncles, are covered, while young, with fine, short tomentum, which disappears before the leaves reach maturity, when they are dark green, thick and leathery. The flowers are rose-colored or pink and white, and delightfully fragrant.

A large proportion of the Apples in the collection produce fruits, for which the lobes of the calyx fall off before it is ripe, and often before it is fully grown, and therefore are best referred to *Pyrus baccata*, in which this peculiarity is the most constant and most apparent character. These plants vary, except in the deciduous calyx, remarkably among themselves, and in looking at some of the extreme forms it is hard to realize that they may be referred to a single species. The habit, flower, foliage and fruit are all different, the last varying in size from a diameter of nearly three-fourths of an inch to one of less than one-eighth of an inch. But with all the forms before me it is impossible to find any real distinguishing characters in them, except the deciduous calyx. *Pyrus baccata* is itself a widely-distributed species in Siberia, through northern China to Japan and in the Himalayas. It has long been cultivated not only in Europe, but from time immemorial by the Chinese and Japanese, so that it is not surprising that innumerable forms have been developed, especially as all the *Pomaceæ* show a remarkable tendency to seminal variation. The most beautiful of the various forms, referred here to *P. baccata*, are those of Japanese origin, known in gardens as *Pyrus Malus floribunda*, and its double-flowered variety (see this journal, i. 152, f. 30) introduced into this country by Dr. Hall, and variously known in American gardens as *P. Parkmanni* or *P. Halleana*. It seems identical with the plant grown in Europe as *P. spectabilis Kaido*. These Japanese Crabs are low, bushy trees, with dark brown bark, branching from the ground, growing to a height, perhaps, of twenty feet, and spreading to a breadth of twenty or twenty-five feet. When they are in bloom they are wonderful objects, the branches being entirely covered with the flowers, which individually are not large and barely more than an inch across when fully expanded. The buds are crimson and very showy, so that the plants are perhaps more attractive just before the flowers open than at any other time. The flowers, when they expand, are pink, and then gradually fade to white before the petals fall; the effect of the white masses of flowers being often set off by a few unopened buds near the ends of the branches. Their fragrance is powerful and delicious, and may be perceived for a long distance when a large plant is in bloom. The fruit is minute, the size of a pea, dull-colored and devoid of beauty. In the semi-double form the petals are deep rose-colored, the calyx dark red, and the young leaves purple.

Among other forms of what are taken here to be varieties of *P. baccata* are several plants of very great ornamental value, with yellow-brown bark, symmetrical, arborescent habit, rather thin, glabrous acuminate leaves, and large, pure, snow-white, fragrant flowers, nearly two inches across when expanded, and small fruit. They have been raised principally from seed derived from the St. Petersburg Garden, and sent under several different names. There are in the herbarium wild specimens gathered in the northern island of Japan, which are identical with some of these forms.

Pyrus Toringo is a Japanese shrubby species which grows well here. The leaves are sharply and deeply incised, and often three-lobed; they are woolly-pubescent, as are the shoots when young; the flowers are smaller than those of the other Apples, and the fruit is minute, with deciduous calyx-lobes. *Pyrus Sieboldii* of gardens seems to be a form of this, still smaller in all its parts. Neither of these plants, except in this pubescence and in the shape of their leaves, are readily separated from *Pyrus baccata*.

Pyrus prunifolia, or a number of plants, which seem more readily referred to that species than to any of the others are the last of the series. *Pyrus prunifolia* is itself a doubtful plant, doubtfully known in a wild state, although generally credited to Siberia. According to Regel it is found in the Baical, and to Karl Koch in north China, Tartary and southern Siberia. It has been cultivated for more than a century, and is the original of the garden Crabs; and if really a wild plant, it has been greatly changed by cultivation and by crossing with varieties of the common Apple. What are considered here forms of this plant are stout bushy trees branching from the ground and forming broad masses of foliage some twenty feet high by as much through. The bark is brown or gray-brown, considerably darker than that of the common Apple-tree. The leaves are broadly elliptical, sharply serrate, with long petioles, and, like the shoots, pubescent when young, especially on the lower surface. The flowers, with pubescent calyx-lobes and hairy styles connate to the middle, are larger than those of the other Apples, being fully two and a half inches across the expanded petals. They are pure white in some individuals, rose-colored fading to white in others, and very fragrant. The fruit has persistent calyx-lobes, is from half an inch to an inch in diameter, bright scarlet on some individuals, clear yellow on others. It retains its shape and color until winter, and remains upon the trees until the following spring. These trees flower much less freely than the varieties of *P. baccata*, and do not flower equally well every year, owing, perhaps, to the presence of some Malus blood, which it seems possible to trace also in the character of the pubescence and the coloring of the young leaves.

Considered from the point of view of ornament, the most valuable of all these Apples, as flowering trees, are the Japanese Crab (*Pyrus Malus floribunda*, of gardens) and its double-flowered variety (*P. Parkmanni* or *P. Halleana*, of gardens); next in value is the Chinese Crab (*Pyrus spectabilis*), then various large-flowered varieties of *Pyrus baccata*, the varieties of *Pyrus Malus*, *Pyrus prunifolia*, which is the only species with ornamental fruit, and the only one, therefore, valuable for autumn effects, and lastly *Pyrus Toringo*, which is rather curious than really beautiful. The North American Crab *Pyrus coronaria* does not flower until several weeks later, but

flowers here profusely. The flowers are individually very large, pale rose-colored, and more fragrant than those of the other species. The fruit which hangs from long, slender stems is ornamental, high colored, and very fragrant. *Pyrus coronaria* is a desirable plant for the garden, both for its flowers and its fruit.

May 11th. J.

The Forest.

A Word for the Jack Pine.

MR. H. B. AYRES, of Minnesota, who is familiar with forest-conditions and the necessity of forest-preservation, sends us, at our request, the following note upon the proper use of the "Jack Pine" (*Pinus Banksiana*) lands so common in the north-central part of the state:

"In looking over the region the importance of keeping out fires is very evident. This sandy soil is not adapted to farming. People will be moving out of the country as soon as the timber is gone. It is therefore important to keep a growth of timber on that land which is not fertile enough to command sale to farmers.

"If fires can be kept from running over the land, timber will continue to grow, and will furnish repeated cuttings of log-timber, piles, ties, cordwood and material for wooden-ware, matches, paper, dyes, acids, tanning, etc. Even the very sandy lands that are cut clean and burned over, and are now worthless, will, if kept from fire, be seeded during the first year, and in a few years be covered with a dense growth of young Jack Pine, with many Norway and some White Pine scattered through them.

"I am aware that most Minnesotians would laugh at the idea of encouraging a growth of Jack Pine; but during a number of years I have given the subject careful attention, and am now convinced that this little, persistent, mean-looking and despised Jack Pine has duties as important and performs them as faithfully as the much sought White Pine. If there were no Jack Pine, I believe a large area in the state would be practically desert to-day, and in proportion as fires are permitted to destroy the young growth, the sandy and rocky land will become desert-like.

"When a tract of Norway Pine timber has been cut clean, and fire kept out, a dense growth of Jack Pine will spring up first; then young Norway Pine will be able to start in the shelter thus formed. As the Norway grows more rapidly, the Jack Pine is soon left as an undergrowth, which serves to prevent the growth of limbs on the trunks of the Norway. In about thirty years the Norway Pine will be large enough to do without the nursing of the Jack Pine, which may then be cut for cordwood, and the Norway, where too thick to leave for log timber, may be thinned for piles and ties, leaving the remainder a tract of clear timber to be coveted by every lumberman, and a good return for reasonable care to encourage tree-growth on land otherwise worthless and unsalable.

"I would earnestly recommend that the existing laws concerning forest fires be rigidly enforced, and such other measures taken as to keep the poor land in timber, thus holding what population there may be now, and even furnishing employment for a greater."

Felling Trees by Electricity.—Hitherto machines for felling trees have been driven by steam-power, but this is often inconvenient, especially in thick woods, because the heavy machinery, including a boiler, must be placed near the tree to be cut. These machines, therefore, can only be used on the borders of forests or in open spaces readily reached by good roads. The *London Times*, however, reports that electric power has been adopted in the Galician forests. Usually in such machines the trunk is sawn, but in this case it is drilled, with a series of holes close together. When the wood is of a soft nature the drill has a sweeping motion, and cuts into the trunk by means of cutting edges on its sides. The drill is actuated by an electric motor mounted on a carriage, which is comparatively light and which can be brought up close to the tree and fastened to it. The motor is capable of turning around its vertical axis, and the drill is geared to it in such a manner that it can turn through an arc of a circle and make a sweeping cut into the trunk. The first cut made, the drill is advanced a few inches and another section of the wood is removed in the same way, until the trunk is half severed. It is then clamped, to keep the cut from closing, and the operation continued until it would be unsafe to go on. The remainder is finished by a hand-saw or an axe. The current is conveyed to the motor by insulated wires brought through the forest from a generator placed at some convenient site, which may be at a distance from the scene of operations. The generator may be driven by steam or water power and does not need to be transported from place to place.

Recent Publications.

The Book of Sun-Dials, compiled by the late Mrs. Alfred Gatty. New and enlarged edition, edited by H. K. F. Gatty and E. Lloyd. Messrs. Bell, London, 1889.

"Whoever loves a garden," it has well been said, "loves a sun-dial," and we need no further apology for introducing this book to our readers. The first edition was published in 1872, and has remained the standard authority on its subject. Now it is republished in a much enlarged shape, the number of dial-mottoes quoted being increased from 377 to 728, and an appendix on the construction of dials being added.

The earliest form of sun-dial was an isolated column or obelisk, which served as the "gnomon," and threw its shadow upon the ground. Such an arrangement could not be scientifically accurate in its measurements, for, as the book before us explains, "the gnomon that indicates the time of day must slope to the horizontal plane at an angle equal to the latitude of the place, and must also lie due north and south." Despite the astronomical lore of the Chaldæans their dials were probably of the primitive columnar kind, as we know to have been the case with the one which Ahaz, king of Judea, set up in the eighth century B. C., probably having got the idea for it from Babylonia. Dials more nearly approaching to the modern kind were known in classic Greece and Rome; but it seems to have been a late day when their function was universally understood, for during the first Punic war a dial captured in Sicily was set up in the Roman forum, where, of course, it could not tell the hours with exactness. All through the middle ages the sun-dial was the usual, almost the only, instrument for marking the time, and it was not abandoned even when clocks and watches became cheap and common. Almost every old church once had its dial, and the clock which now appears on so many English churches usually shows the station formerly held by the gnomon and circle. A national English custom—shown in some of the great cathedrals as well as in very many parish churches—was to make the south door, not the one in the west front, the chief place of entrance; and over this door the dial was usually set upon the wall. In the early days of the Reformation, when so many mortuary crosses were injured or defaced as bearing superstitious emblems, it was common to turn them into sun-dials, cutting off the top to secure a level space where the gnomon and its brass plate might stand. The finest standing dials in Great Britain seem to date from the period when the classic style of gardening ruled—the seventeenth and the early eighteenth centuries. The most stately of all is perhaps the one which stands at Glamis Castle (famous through its connection with Macbeth), near Forfar in Scotland, which is an elaborate architectural construction bearing no less than eighty dial-faces. Pretty conceits are sometimes found in which the service of a true dial is simulated by growing plants. At Wentworth Castle, near Barnsley, for example, a tall Yew-tree serves as a gnomon, while an encircling plantation of Box is cut into the form of a dial-plate and its figures. In southern countries, where there is a more constant sun, dials are still more frequently found than in England, and every traveler will remember them as forming, very often, the quaintest and most suggestive feature in an ancient garden. Mrs. Gatty and her editors have covered a wide field in searching for the inscriptions which were almost invariably placed upon the sun-dial; and the large collection of mottoes given in the new edition now before us is both instructive and amusing. Of course brief familiar mottoes such as "Tempus Fugit," "Improve the Time," "Fugit Hora," "Docet Umbra," "Cosi la Vita," "Carpe Diem," Brevis Hominum Vita," "Via Vita," "Vigilate et Orate," Vita Sic Transit" and "Work While it is Day," represent the most common class of inscriptions, but there are many in various languages which are much longer, and are either quotations from some poet or original exhortations to improve the passing hour and remember the coming of the night wherein no man can work. "You may waste but you cannot stop me" is one, and another is "Life is Short, Time is Swift, Much is to be done." From among the longer English verses we select a few, although choice is difficult where so many are interesting, and foreign languages are still richer in epigrammatic examples.

"Time's glass and scythe
Thy life and death declare;
Spend well thy hours and
For thy end prepare."

"Give God thy heart, thy hopes, thy gifts, thy gold;
The day wears on, the times are waxing old."

"Haste, traveler, the sun is sinking low;
He shall return again, but never thou."

"May the dread book at our last trial,
When open spread, be like this dial;
May Heaven forbear to mark therein
The hours made dark by years of sin;
Those only in that record write
Which virtue, like the sun, makes bright."

For Lady Abney at Newington, Dr. Watts wrote the following:

"So rolls the sun, so wears the day,
And measures out life's painful way
Through shifting scenes of shade and light,
To endless day or endless night."

But much prettier is the following, a modern imitation of the style of old mottoes, designed for a dial in a flower-garden, with which we must close our brief list:

"I stand amid the summere flowers,
To tell the passage of the houres;
When winter steals the flowers awaye,
I tell the passinge of their daye.
O man, whose flesh is but as grasse,
Like summere flowers thy life shall passe.
Whiles tyme is thine laye up in store
And thou shalt live for evermore."

Here and there in old American gardens sun-dials may still be seen, although it is doubtful whether any are erected at the present day or whether a skillful professor of "gnomonics"—the art of dial-setting—could be found in America. It would be interesting to know whether any inscriptions worth quotation exist on this side of the ocean.

Correspondence.

Arbor Day at Michigan Agricultural College.

To the Editor of Garden and Forest:

Sir.—I have been much interested from time to time in the sensible comments of Garden and Forest on the modes of observing Arbor Day. Where a programme is devised by persons who have little knowledge of botany, horticulture or forestry in its true and broad sense, there is great danger that the exercises may accomplish as much harm as good. We have had quite enough of mere unadulterated sentiment on this very important subject.

After such comments it may be venturesome to send a few notes on the observance of Arbor Day at this place. One hour was occupied by the writer and nearly sixty students who were introduced one after the other, each to present some selection from a reliable source, or to produce original notes:

(1) Reading the Arbor Day proclamation; (2) the origin of Arbor Day (in Nebraska); (3) verses from the Bible on trees, by the President of Y. M. C. A.; (4) quotations from Shakespeare; (5) uses of Arbor Days, Garden and Forest, p. 13, vol. ii.; (6) selection from Nebraska's Arbor Day book, B. E. Fernow; (7) "The Planting Season is at Hand," A. J. Downing; (8) "Cherish Trees," A. J. Downing; (9) "Plant Trees," A. J. Downing; (10) "What to Select," A. J. Downing; (11) "Plant Home-grounds," from Nebraska's Arbor Day book, Professor L. H. Bailey; (12) "Plant School-grounds next," L. H. Bailey; (13) "Plant the Roadsides," L. H. Bailey; (14) "What Shall We Plant?" L. H. Bailey; (15) "Plant Many Shrubs," L. H. Bailey; (16) verses; (17) "Plant a Tree," verses by Edith M. Thomas; (18) "Plant a Tree," Ex-Gov. Larrabee, of Iowa; (19) "Plant in Memory of Some Friend;" (20) "A Tree is a Valuable Possession," Garden and Forest, p. 37, vol. ii.; (21) "A Love for Trees," A. J. Downing; (22) "Tree-planting," Dr. O. W. Holmes; (23) "How to Take up a Tree;" (24) "How to Set a Tree;" (25) "Don't," a series of precautions; (26) "Value of Trees," Whittier; (27) "Beautiful Trees," A. J. Downing; (28) "The Beautiful in an Ornamental Tree," A. J. Downing; (29) "The Tree as Improved (?) by the Tree-pruner," A. J. Downing; (30) "Beauty of Autumnal Foliage," A. J. Downing; (31) "Proud Monarch of the Forest," verses; (32) "The White Oak," Dr. O. W. Holmes; (33) "Peculiarities of the American Elm;" (34) "Management of our Forests," Garden and Forest; (35) "Needs of American Forestry," Garden and Forest, p. 13, vol. ii.; (36) "Needs of American Forestry," Garden and Forest; (37, 38 and 39), extracts from Garden and Forest, on "Providing for the Conservation of our Forests,"

Two years ago a portion of the day was given up to comments by some of the professors in a lecture-room, where students and others had assembled. Each class and society, including the girls, planted a tree with some ceremony. The trees were publicly accepted by the president of the college, and good care guaranteed. At the last Arbor Day, reports were made stating the species of the tree, where it was located, how much the upper branches had grown last year, what care it had received and whether any insects had injured it. The statements brought out facts, showing that it is vastly easier to plant trees than to give them proper care afterwards. Not one of the entire number had made satisfactory growth, and only one had received any cultivation; none had been mulched, but they were left in the grass where, in several cases, the soil was too thin to guarantee thrift. Of the twelve trees one was dead, two others nearly so, one had been cut down and was sprouting up again, several others were having a severe struggle with grass and a thin soil and a lack of moisture. Several had been damaged by borers.

The last two classes planted trees this year and made reports.

The quotations above indicate that your journal is making some impression in at least one school of agriculture.

Agricultural College, Mich. *W. J. Beal.*

The Newtown Pippin.

To the Editor of Garden and Forest:

Sir.—I was much interested in the letter of Mr. Robinson, the editor of *The Garden*. He had evidently been eating an Albemarle Pippin, a strain of the yellow Newtown Pippin, which the Americans, he quotes, probably never saw, for few of them stop on this side of the water. Doubtless the great majority of American Apple-growers have Apples better than the Newtown Pippin is with them, for there is no Apple grown which is so fastidious as to its location. Even here, where it reaches its highest perfection, it is utterly worthless a mile away from a mountain-side. And yet the lands, which of all others, produce this Newtown Pippin in the highest perfection, the mountain coves and slopes of the Blue Ridge in Albemarle, Nelson and Green Counties, of Virginia, can to-day be bought at very low figures. Here in Albemarle few growers of Mountain Pippins ever think of gathering and packing their own fruit. The agents of the English shippers come all through the hills, buy all the Apples at a set price, and at the proper time bring their barrels, gather and ship the fruit. Occasionally a large grower packs and ships his fruit direct to Liverpool, and makes largely by so doing. Last fall Apples of all kinds were very abundant and low in price, and yet the Liverpool shippers paid here for the fruit on the trees $2.50 a barrel and furnished the barrels and packed them. The year before the price was $4.50. It is well known that the Albemarle Pippin always leads in price Pippins grown elsewhere, and some are disposed to question its identity with the yellow Newtown Pippin. The great majority of us, however, are willing to admit their identity, but adhere to the name of Albemarle Pippin as expressive of the choicest Pippins sold.

Crozet, Va. *W. F. Massey.*

To the Editor of Garden and Forest:

Sir.—I do not think the Newtown Pippin is unduly neglected. It is not a profitable market variety for the northern States, and is entirely eclipsed for profit by the Baldwin at the East and by the Ben Davis at the West, both of which are inferior in quality, especially the latter. Our people in this country well understand where to find the best returns, and with this view the Newtown Pippin has been generally discarded at the North as a market fruit. It is still cultivated both East and West as an amateur variety.

I have not had an opportunity of comparing the Albemarle with the Newtown Pippin, but have always taken it for granted from the examination of others who are competent pomologists, that they are identical.

In some localities further south the Newtown Pippin succeeds better than here. I have examined specimens from the neighborhood of Cincinnati which were larger and smoother than we have them. In some parts of Virginia (not on the lowlands) it has succeeded well and has been largely raised for market. In other places it has entirely failed. It was formerly more extensively raised in New York than at present, but its liability to become scabby was a severe drawback. R. L. Pell, who formerly had a large orchard of this Apple in Ulster

County, with all his care in cultivation, had to throw out many defective specimens in sorting for English markets. He informed me that in making an extra selection of the very finest he took at the rate of about one specimen in a half bushel, and these sold for about double the usual price—nevertheless, they did not pay cost. This was some forty years ago.

I never quite agreed with A. J. Downing that the Newtown Pippin stood at the head of all Apples, and was "unrivalled in all the qualities which constitute a high-flavored dessert fruit." Different individuals have varying preferences, and I have known a person who from early association preferred the coarse Pennock to all others. I would place such Apples as Northern Spy, Swaar, Red Canada and Jonathan, as quite equal in quality to the Newtown Pippin, while Esopus Spitzenburgh is hardly equalled in high flavor by any Apple. The Newtown Pippin loses less by shipment across the ocean than most others, which is doubtless one reason why it is so highly esteemed there.

I have no doubt that this fruit, as grown in favorable localities in Virginia, is better than in New York, judging from the fact that the Cincinnati specimens which I have received were larger and fairer than our spotted and defective ones here.

Union Springs, N. Y. *J. J. Thomas.*

[The letter above was not written for publication, but every statement or suggestion made by Mr. Thomas in relation to our fruits is worth preserving.—ED.]

The Germantown Nurseries.

To the Editor of GARDEN AND FOREST:

Sir.—These nurseries are situated within the limits of the city of Philadelphia, where land is worth four or five thousand dollars an acre, and when I asked Mr. Thomas Meehan, the senior member of the firm, if he was not cultivating rather expensive soil, he replied that he could not afford to conduct his business on cheap land. He went on to say that if his nurseries were moved back into the country the money saved by reduced interest on the price of land would be more than counter-balanced by the increased cost of labor and manure, of transportation, and, in short, of everything he had to buy for his business. As a matter of fact he sells hundreds of thousands of Osage Orange plants, raised on this city property, for hedges on western farm-lands. He added that in a remote location his business could not advertise itself as it now does so cheaply and to such advantage, and he considers this effective advertising an important factor in the success he has achieved. And really there are few places in the United States where a fine collection of ornamental trees and shrubs would attract so many interested and appreciative visitors. Germantown is as old as the big city, which absorbed it more than thirty years ago, and it has always been the home of wealth and refinement. Here lived noted botanical collectors early in the century, and rare and beautiful trees were planted on most of the old estates. Although these estates have been cut up, many of the venerable trees have been carefully preserved. A drive through the town will take one by a Pecan-tree, for example, a hundred feet high, which, by the way, bears fruit about every other year. Not many Pecan-trees were growing in the Middle States when the nut was planted, or the seedling set, which has developed into this superb specimen. Here, too, is a *Magnolia Fraseri* fifty feet high, which was certainly one of the first ever brought to the North, and a Yellow-wood, which Audubon probably brought here on horseback. Magnificent English Elms, and Yews unmatched in this country, not to speak of countless grand old native trees, testify that the people of Germantown in the first half of this century had learned to select good trees, and knew how to plant and how to care for them after they had been planted. Under the influence of such traditions and such living examples, the new-comers who have been drawn here to find a country life in the city are lovers of trees and shrubs, and Thomas Meehan & Son stand ready to satisfy their longings.

It was on the 22d of May when I reached Germantown, but the trees seemed already dressed in the full foliage of June. The Tulip-trees, which are very abundant here, were covered with flowers, and the White Fringe was blossoming on the lawns. On either side of the entrance to the Nurseries I found a Weeping Elm, and the pair bear witness to the genial conditions of soil and climate here, standing some forty-five feet high—a growth made in twenty years. These trees have a distinctively pendulous habit, and were among the earliest planted of the variety which has been sold as the Weeping, Red or Slippery Elm. The seed this year, however, makes it plain that this form is really a variety of the White or American Elm. Other trees besides the Elms grow here with notable rapidity, and one of the most interesting studies is a long row of various kinds which were set out fifteen years ago when less than an inch in diameter. Of all these, a Celtis now takes the lead with a diameter of about ten inches, but many of the Oaks are following close after, among them a Red Oak, a Chestnut Oak, a Black Oak and a beautiful Swamp White Oak. These specimen Oaks reminded Mr. Meehan to say that he finds the Oaks, as a class, among the easiest to grow, and he has no difficulty in transplanting even large specimens. He added that if his business had developed in the direction of any specialty it was towards the sale of large trees. A man who moves into Germantown and builds a house insists on planting some trees about it that are big enough to drop a shadow on his lawn. He wants a tree which he can see now, and not a little seedling with only the hope of a tree in it. He asks for trees twenty-five feet high and he gets them. In Mr. Meehan's practice, that much-talked-of ball of earth about the roots is dispensed with, and yet large trees are rarely killed or severely checked by removal. His process is to spade out a circular ditch two feet deep, with a radius of six feet, say, from the centre of the tree—greater or less, according to size—and then to carefully throw back all earth from the roots within the circle with a fork. The saving of all the smaller roots he considers useless. No root carried away with the tree takes up any food or moisture. This work is done by the fine root-hairs that are thrown out after the tree is set. The best time to take up the tree is after the leaves have ripened in autumn, but before they have fallen; and this gives time to make working roots before frost, so that the tree can be supplied with moisture to protect it against excessive drying out in winter. Of course the earth should be packed tightly about the roots. Mr. Meehan's directions are to plant the tree as you would set a post—ram very firmly, and then a big tree will need no staking.

A walk through the sixty-five acres devoted to ornamental trees and shrubs showed that something like a thousand varieties are grown here, mainly for a retail trade. Among our western conifers I noticed thrifty specimens of Lawson's Cypress and *Thuya gigantea*, while *Pinus contorta*, which is often a disagreeable subject to handle, did not seem at all unhappy, a result which Mr. Meehan attributed to the fact that it was grafted on Scotch Pine stock. But space would fail if even the names were given of all the interesting conifers which are grouped here in the specimen grounds. One, however, must not be omitted—a *Thuya* (*Retinispora*) *squarrosa* which set out in life with the bluish-gray and closely-massed foliage of this variety. But after a year or so the tree saw fit to abandon this juvenile form, and it forthwith assumed another, throwing out the soft green, feathery spray of *T. plumosa*, and so it stands to-day, with the upper branches as distinct from those near the ground, as if one belonged to a graft and the other to the stock. Many other eccentricities were pointed out, as, for example, a seedling Halesia, which differs from the type in characters strong enough to place it in a distinct genus, while seedlings from it have reverted to the original form. I observed that our native shrubs were grown in great abundance, and Mr. Meehan said that for planting large places especially, there was a rapildy increasing demand for them, and, in fact, for native trees as well. Foreign shrubs, however, are not neglected, as a block of two or three acres of *Viburnum plicatum* testified. These plants were all white with snow-balls, and made a pretty sight; nor were they unprofitable, for every one had been spoken for by a city florist, and the money received for the crop would go far towards paying for the production of the plants. This was noticed as another advantage of tilling an urban farm.

Upon the lawn about Mr. Meehan's house are many trees of exceptional beauty and interest. The original Weeping Dogwood stands here, and no tree with pensile branches can be more graceful. Near it is a perfect specimen of the lovely Oriental Spruce, and not far away is a very large *Picea pungens* which has a softness of outline unusual in this somewhat rigid tree. The largest Golden Retinospora I have ever seen is here, and is, I believe, one of the first four which came to this country, having been presented to Mr. Meehan by Mr. Francis Parkman. A large specimen of the dark-leaved Japanese Maple was pointed out as an example of the vigor and health which characterize these trees when grown on their own roots, and nearly every other tree had some special interest from its history or from the lesson it taught. After the instructive walk through these grounds, a delightful hour was spent in the library, which contains a remarkable collection of works on horticulture and the sciences related to it. Many of the books are presentation copies from such authors as Darwin, Hooker, Gray and Engelmann. One little manu-

script volume contained a complete list, by Mr. Meehan, of all the evergreens growing in the plant-houses at Kew Gardens in 1845, and it is on record in Bromfield's "Flora Vectensis," edited by Hooker & Salter, that at a period still earlier than this a new variety of *Veronica Chamedrys* had been detected in the Isle of Wight by Thomas Meehan, aged fifteen years. The eye of the botanist is still undimmed and his natural force is not abated, but these glimpses of his early life remind us how many years have been industriously given to his favorite pursuit. The city of Philadelphia now claims his services, and has for several successive terms, as Councilman. He has been active, among other things, in securing the purchase of Bartram's Garden and other land for small parks, and these will, no doubt, prove a source of health and refreshment to the thronging population of the great city of the future. Let us hope, however, that he will undertake no labors which will interrupt his studies or quite deprive the horticultural world of such instruction as he imparted for so many years in the columns of the *Gardeners' Monthly*.

Philadelphia. *S.*

Notes.

An International Congress of Agriculture and Forestry will be held in Vienna during the summer of 1890.

The famous Botanical Gardens at Edinburgh are now for the first time opened to the public on Sundays.

Myosotis alpestris, Victoria, proves to be a perfect border-plant in this latitude, hardy without protection and easily multiplied by division or from seed.

The Cucumber Flea Beetle, which did so much damage to Potatoes in many places near this city last year, has again attacked the leaves of these plants, and the remedies so far tried have not been able to check its ravages.

Concerning *Magnolia Campbellii*, of which mention was made in this journal last week, Mr. S. B. Parsons writes that twenty years ago he imported a plant two and a half feet high, for which he paid five guineas. It grew well, but was not hardy in the open air.

Mr. Josiah Hoopes sends us some immense, snow-white clusters of the sterile flowers of *Viburnum macrocephalum*, with the note that it is one of the most conspicuous plants on his grounds, and the shrub is flowering better than ever before at the Arnold Arboretum. This Viburnum, which was mentioned in this journal last year (vol. i., p. 226), seems much more vigorous about Philadelphia than it is further north.

The crop of "May Haws," as the beautiful fruit of *Cratægus æstivalis* is called, has been very abundant the past spring in western Louisiana. It ripens there in the latter part of April or early in May, and is gathered in great quantities and brought into the towns and sold for making jellies, jams and preserves, for which it is well suited. This is one of the most beautiful of all the Hawthorns, and would be a desirable ornamental tree in the South, although it is doubtful if it has ever been cultivated.

A report that will prove of special interest to residents of the territory drained by the Rio Grande has lately been made by Professor G. E. Curtis, of the United States Geological Survey. The report contains information as to the amount of snow which fell last winter along the tributaries of the Rio Grande, and this amount is used as a basis for estimating the probable amount of water which will be available for use by farmers and stock-raisers during the coming season. Questions as to the depth of snowfall were answered by 120 persons, and the general amount and distribution of the snow were clearly indicated. As a whole, the snowfall seems to have been above the average, although in one considerable region it was much less than usual. It will be interesting to observe how far the predictions as to the water-supply will be fulfilled.

During the week past the United States Nurseries, at Short Hills, New Jersey, have been thronged with visitors to see the remarkable display of rare Cypripediums now in bloom, as well as many other choice Orchids. The most wonderful specimen of all is a new Cattleya, belonging to the Gigas type. The stout pseudo-bulbs are between nine and ten inches long, and the leaves are very thick, one foot long by nearly five inches broad. The plant carries two spikes of flowers, one with six, the other with four flowers. The individual flowers are of enormous size, each of the petals being five and a half inches long by three broad, and the sepals are of the same length, the whole being a deep lake color. The lip is three and a half inches broad, rich purple, with two yellow eyes. This is the first time the plant has flowered since its importation, and it is pronounced by enthusiastic Orchid-growers the grandest Cattleya they have ever seen.

The centre of bulb-culture in Holland, says *Gartenflora*, is still at Haarlem, as it has heen during two centuries and a half. Hyacinths are especially in favor just now, and ground suitable for their cultivation has sold for as much as $13,500 an acre, as against about $1,000 given for land of other kinds. The expense of cultivation is placed at about $300 an acre for Hyacinths and $160 for Tulips; and it is noted that artificial manures are never used. Narcissus is also grown in vast quantities near Haarlem, chiefly for exportation to England. Formerly the export trade in cut flowers was enormous, one Haarlem firm having exported in a single season 10,000 cases; but an agreement was last year entered into by a majority of the Dutch florists to abandon the sale of cut flowers as competing with the interests of purchasers of bulbs. Attempts have been made to extract the perfume of Hyacinths, but only with moderate success, especially from the commercial point of view.

The *American Florist* recently published a picture of a very pretty basket of flowers in which Roses, Orchids and Carnations were disposed in a loose and graceful way, and so massed that both contrast and harmony were secured. Sensible words were spoken in the accompanying text where it was hoped that the sight of so charming an arrangement "will result in converting to more natural methods some of that altogether too numerous class who turn out those stiff, formal arrangements in which the grace and loveliness of each flower is annihilated by crowding together as compactly and evenly as the blades of grass in a smoothly-shaven lawn. In the 'elevation of our profession' the retail florist has a grand opportunity here to do his share. The better class of flower-buyers — people of wealth and taste who are large buyers—are quick to appreciate a really artistic arrangement and will pay well, not only for fine flowers, but for the taste and skill displayed in their arrangement."

A late number of the *Popular Science Monthly* contains a sensible letter on "Silk Culture in the United States" by Mrs. M. W. Brooks, of Salem, Massachusetts. This letter clearly shows, by quotations from various authorities, that the risks of this business are too great and the competition with Chinese labor too close for it to afford American women any fair chance of earning a livelihood. "The raising of silk-worms involves a minute and incessant labor such as Orientals appear to be alone thoroughly fitted for, and it is not at all adapted to the capacities of American women. . . . Silk culture is no experiment, even in this country; it simply does not pay a people who want to earn more than one cent per hour." An example is given of a case that has been quoted as "successful." In Johnson County, Missouri, two women and four children "tried the experiment for two years." The net profits at the end of the two years were $57.90. It is no wonder that Mrs. Brooks thinks that the Department of Agriculture in Washington might do better work than that distribution of silk-worm eggs, in which it is still engaged.

On the 4th of May Professor Bickmore delivered at the Museum of Natural History, in this city, the last of the series of one hundred lectures to the teachers of New York City and State, which he has given under the direction of the State Department of Public Instruction. His subject was "The Forests of America," and, with the help of excellent stereopticon slides, he showed how the three main currents of wind which perpetually encircle the globe have governed the distribution of its forests. South of the Tropic of Capricorn, he explained, the wind blows continuously from the west, and is deprived of its load of moisture by striking the mountains near the western coast. Here, therefore, one finds a rich forest-region, while the dry pampas of Buenos Ayres stretch between the mountains and the Atlantic. In the equatorial regions, between the Tropics of Capricorn and Cancer, the wind blows steadily from the east; hence the enormous forests of Brazil and, across the Andes, the desert, because rainless, region of Peru. North of the Gulf of Mexico the current of wind is again from west to east, producing the heavy forests of the Pacific slope; and beyond the Rocky Mountains, which have condensed all moisture on their western sides, lies that vast interior region which, dry and unpromising as it seems, needs only water to make it blossom as the rose. The verdurous tree-clad condition of the eastern coast region is owing, of course, to the fact that local winds bring them moisture from the Atlantic Ocean.